



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/649,723	08/28/2003	Takeshi Ohno	2003_1241A	6185

513 7590 02/09/2005

WENDEROTH, LIND & PONACK, L.L.P.
2033 K STREET N. W.
SUITE 800
WASHINGTON, DC 20006-1021

EXAMINER

CAO, HUEDUNG X

ART UNIT PAPER NUMBER

2821

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/649,723

Applicant(s)

OHNO ET AL.

Examiner

Huedung X Cao

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8, 12, 14-20 and 23-26 is/are rejected.
- 7) ☐ Claim(s) 5-7, 9-11, 13, 21-22 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/26/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 08/30/2002. It is noted, however, that applicant has not filed a certified copy of the Japanese application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

Art Unit: 2821

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-4, 14-20, and 23-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over SUGIO et al. (JP 2002185240 A) in view of ZHANG et al. (USP 6,201,509).

As per claim 1, Sugio teaches the claimed "dielectric loaded antenna apparatus" comprising: "a column-shaped loaded dielectric which is loaded on an end portion of a feeding line of the dielectric loaded antenna apparatus" (Sugio, figure 3, the dielectric post 3). It is noted that Sugio does not teach said loaded dielectric having "an inclined radiation surface" which is inclined from a surface perpendicular to an axial direction of said loaded dielectric. Zhang teaches that such "inclined radiation surface" is well known in the art (Zhang, column 8, line 61 to column 9, line 5; the inclined radiation surfaces 102 and 110). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Zhang, to configure Sugio's apparatus as claimed by modifying the perpendicular surface to be a inclined radiation surface in the loaded dielectric post. The purpose of using an inclined radiation surfaces is to control and modify the bandwidth and peak pattern in the axial direction (see column 9, lines 4-5 of Zhang).

Claim 2 adds into claim 1 “a cross section of said loaded dielectric perpendicular to the axial direction of said loaded dielectric has a shape of one of circle, ellipse and polygon” which Sugio teaches in the cylindrical dielectric post 3 (figure 3).

Claim 3 adds into claim 1 “said feeding line is a waveguide” (Sugio, waveguides 4A and 4B), and “wherein said waveguide includes: a radiation waveguide having an axis parallel to the axial direction of said loaded dielectric and including an opening for feeding an electromagnetic wave to said loaded dielectric; and a feeding waveguide for feeding the electromagnetic wave to said radiation waveguide” (Sugio, figure 3, waveguide chambers 1A-1B).

Claim 4 adds into claim 3 “a dielectric is filled into an interior of said waveguide” (Sugio, figure 12, waveguide chambers).

Claim 14 adds into claim 1 “the inclined surface of said loaded dielectric is one of a surface inclined from an electric field plane of a radiated electromagnetic wave and a surface inclined from a magnetic field plane of the radiated electromagnetic wave” which Sugio does not teach. However, Zhang teaches that such “inclined radiation surface” is well known in the art (Zhang, column 8, line 61 to column 9, line 5; the inclined radiation surfaces 102 and 110). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Zhang, to configure Sugio's apparatus as claimed by using the inclined radiation surface in the loaded dielectric post. The purpose of using an inclined radiation surfaces is to control and modify the bandwidth and peak pattern in the axial direction.

Art Unit: 2821

Claim 15 adds into claim 1 "circularly polarized wave radiating device for radiating an electromagnetic wave radiated from said dielectric loaded antenna apparatus as a circularly polarized wave" which Sugio teaches in paragraphs [0010] and [0011].

Claim 16 adds into claim 15 "said feeding line is a waveguide, and wherein said waveguide includes: a radiation waveguide having an axis parallel to the axial direction of said loaded dielectric and including an opening for feeding an electromagnetic wave to said loaded dielectric" (Sugio, waveguide chamber); and "a feeding waveguide for feeding the electromagnetic wave to said radiation waveguide wherein said circularly polarized wave radiating device is constituted by forming the opening of said feeding waveguide in a hexagonal shape" (Sugio, figure 4, waveguide line; figure 21; and paragraph [0008], last line).

Claim 17 is similar to claim 1 but adds "a plurality of dielectric loaded antenna" which Sugio teaches in a plurality of dielectric poles in figure 16.

Claim 18 adds into claim 17 "respective inclined surfaces of said loaded dielectrics of said dielectric loaded antenna apparatuses are inclined at a predetermined inclination angle in a predetermined direction so as to attain a predetermined directivity pattern of said array antenna apparatus" which Sugio does not teach. However, Zhang teaches that such "inclined radiation surface" is well known in the art (Zhang, column 8, line 61 to column 9, line 5; the inclined radiation surfaces 102 and 110). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made, in view of the teaching of Zhang, to configure Sugio's apparatus as claimed by

Art Unit: 2821

using the inclined radiation surface in the loaded dielectric post. The purpose of using an inclined radiation surfaces is to control and modify the bandwidth and peak pattern in the axial direction.

Claim 19 adds into claim 17 "a switching device for selectively switching said loaded dielectrics to connect the selected loaded dielectric to the feeding line" which Sugio teaches in the activations of the dielectric poles in figures 15 and 21; and paragraph [0003], lines 1-4.

Claim 20 adds into claim 17 "arrangement of said respective loaded dielectrics is changed according to an installation position of said array antenna apparatus" which Sugio teaches in the arrangements of the dielectric poles (figures 15 and 21) to provide the corresponding shape of the antenna.

Claim 23 claim the apparatus of claim 1 and adds "a radio transceiver circuit" provided either one of on a surface of said substrate and in said substrate, said radio transceiver circuit being connected with said dielectric loaded antenna apparatus which Sugio teaches in the wave guides 4A-4B receiving/transmitting signals to utilizing the antenna.

Claim 24 adds into claim 23 "a modulator and demodulator circuit provided on the surface of said substrate or in said substrate, said modulator and demodulator circuit being connected with said radio transceiver circuit" which Sugio teaches in wave guides 4A-4B receiving/transmitting signals to utilizing the antenna in which the modulator and demodulator are used for the electromagnetic wave process.

Claim 25 claim the apparatus of claim 17 and adds "a radio transceiver circuit"

Art Unit: 2821

provided either one of on a surface of said substrate and in said substrate, said radio transceiver circuit being connected with said dielectric loaded antenna apparatus which Sugio teaches in the wave guides 4A-4B receiving/transmitting signals to utilizing the antenna.

Claim 26 adds into claim 25 "a modulator and demodulator circuit provided on the surface of said substrate or in said substrate, said modulator and demodulator circuit being connected with said radio transceiver circuit" which Sugio teaches in wave guides 4A-4B receiving/transmitting signals to utilizing the antenna in which the modulator and demodulator are used for the electromagnetic wave process.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over SUGIO et al. (JP 2002185240 A) in view of ZHANG et al. (USP 6,201,509) as applied to claim 1 above, and further in view of KEOUGH (USP 5,831,581).

In claim 8, Chen and Zhang disclose substantially the claim invention as noted above except for "said feeding line is a microstrip line formed on a dielectric substrate, and wherein a feeding patch conductor which feeds an electromagnetic wave to said loaded dielectric is provided on an end portion of said microstrip line". However, Keough teaches such feeding line is a microstrip line formed on a dielectric substrate, and wherein a feeding patch conductor which feeds an electromagnetic wave to said loaded dielectric is provided on an end portion of said microstrip line is well known in the art (column 6, lines 8-20). It would have been obvious to place the feeding patch

Art Unit: 2821

conductor at the end of the feeding microstrip line to receive the signals and to use a microstrip line as a feeding line to reduce the space of the circuit.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over SUGIO et al. (JP 2002185240 A) in view of ZHANG et al. (USP 6,201,509) as applied to claims 1 above, and further in view of HELMS et al. (USP 5,757,324).

In claim 12, Chen and Zhang disclose substantially the claim invention as noted above except for "a radome which covers said dielectric loaded antenna apparatus, wherein said radome and said loaded dielectric are formed integrally with each other". However, Tassoudjii teaches that a radome which covers said dielectric loaded antenna is well known in the art (column 6, lines 50-55). It would have been obvious to provide a housing sheltering the antenna such as radome formed integrally with the loaded dielectric because it provides the protection for the antenna from the external collisions.

Allowable Subject Matter

8. Claims 5-7, 9-11, 13, and 21-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

In claims 5-7 and 9-11 the prior arts fail to teach "a loaded dielectric is arranged so that a central axis of said loaded dielectric is shifted from a central axis of said radiation waveguide or said feeding patch conductor".

In claim 13, the prior arts fail to teach "said feeding line includes a waveguide and a microstrip line" and "a converter which is inserted between said waveguide and said microstrip line".

In claim 21, the prior arts fail to teach "a part of each of said loaded dielectrics is eliminated according to an installation position of said array antenna apparatus".

In claim 22, the Prior art fail to teach "said dielectric loaded antenna apparatuses are arranged so that linear polarized waves of the electromagnetic waves radiated from each pair of dielectric loaded antenna apparatuses arranged to be adjacent to each other among said dielectric loaded antenna apparatuses are perpendicular to each other".

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Holden et al. (USP 6,211,824 B1) teach an integrated directional patch antenna uses multiple patch radiating elements to control the directional of a beam of radio frequency energy over a large scan volume.

Rief et al. (USP 6,271,799 B1) teach an antenna device includes a dual polarized quad-ridge antenna horn.

Art Unit: 2821

Inquires

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Huedung Cao whose telephone number is (571) 272-1939.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Don Wong, can be reached on (571) 272-1834. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

12. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Huedung Cao
Patent Examiner